NARROWS BRIDGE HAER No. PA-449
(Lincoln Highway, Bridge over Raystown Branch of Juniata River)
Pennsylvania Historic Bridges Recording Project
Spanning Raystown Branch of Juniata River at Lincoln Hwy. (U.S. Rt. 30)
Bedford vic.
Bedford County
Pennsylvania

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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NARROWS BRIDGE
(Lincoln Highway, Bridge over Raystown Branch of Juniata River)

HAER No. PA-449

Location:	Spanning Raystown Branch of Juniata River at Lincoln Hwy. (U.S. Rt. 30), Bedford vicinity, Bedford County, Pennsylvania.
USGS Quadrangle:	Everett West, Pennsylvania (7.5-minute series, 1987).
UTM Coordinates:	17/715760/4432220
Date of Construction:	1935.
Builder:	Pittsburgh Construction Company.
Designer:	Pennsylvania Department of Highways Bridge Unit.
Present Owner:	Pennsylvania Department of Transportation.
Present Use:	Vehicular bridge.
Significance:	The Narrows Bridge is an early example of a concrete arch bridge built on a curving, skewed alignment. This open-spandrel reinforced concrete bridge is the most recent of several at this important crossing, which was on the Bedford-Chambersburg Turnpike before it became part of the Lincoln Highway in the 1916. The Narrows Bridge was listed in the National Register of Historic Places in 1988.
Historian:	Blythe Semmer, August 1997.
Project Information:	This bridge was documented by the Historic American Engineering Record (HAER) as part of the Pennsylvania Historic Bridges Recording Project - I, co-sponsored by the Pennsylvania Department of Transportation (PennDOT) and the Pennsylvania Historical and Museum Commission during the summer of 1997. The project was supervised by Eric DeLony, Chief of HAER.

Description

The Narrows Bridge spans the Raystown Branch of the Juniata River in Snake Spring Township, Bedford County, Pennsylvania. It carries U.S. Route 30, the Lincoln Highway, across this historically significant river crossing and an abandoned Conrail railroad track, one mile east of Bedford, the county seat. The western approach curves gently toward the bridge, which reaches the river's eastern bank just before the road passes underneath the Pennsylvania Turnpike. The river forms a natural gap in the terrain at this site, providing a convenient passage through Evitt's Mountain. The Pennsylvania Turnpike and Lincoln Highway crowd together at the Narrows water gap. This span was designed by the Pennsylvania Department of Highways bridge unit in 1934. Bridge engineer E. E. Brandon approved the plans for the structure in October 1934. The Pittsburgh Construction Company constructed the bridge, which was completed in 1935.

This unusual open-spandrel reinforced concrete arch bridge intersects the Raystown Branch at a skew because the roadway curves horizontally as it crosses the water. The average degree of skew for the structure is 42 degrees. The roadway also ascends a 2.5 percent grade from east to west across the span. Five 119'-0" arch spans resting on four tall piers carry a roadway 42'-0" wide. The deck itself, which is 43'-8"' wide, is a 9-1/2"-thick reinforced concrete slab with a concrete wearing surface and bituminous concrete overlay. Concrete-encased steel I-beams support the roadway. The structure's total length is 599'-0", and the height of the piers permits a vertical clearance of 45'-0" over the river. Concrete abutments support the bridge's superstructure.[1]

The spandrel columns and arch ribs appear light in contrast to the tall, heavy piers. The piers are concrete with scored coursing lines and are at an angle to both the roadway and the flow of the river. The concrete abutments are scored in the same fashion. The roadway itself is banked around the turn and is therefore elevated slightly higher over the water on the downstream side of the bridge. A simple concrete balustrade lines the roadway.

Proposed Rehabilitation of the Narrows Bridge

The Narrows Bridge is currently in need of rehabilitation, as the concrete structure is deteriorating. The ever-increasing traffic demands on this section of Lincoln Highway also necessitate the addition of more lanes at this crossing, which carries only one lane of traffic in each direction and a center left-turn lane. According to William Delancey of Pickering, Corts & Summerson, Inc., the engineering firm preparing plans for the rehabilitation of the Narrows Bridge for PennDOT, five lanes would be ideal for the amount of traffic carried by the bridge. In the project development process, Pickering, Corts & Summerson have identified three possible means of creating two more lanes at the Narrows Bridge. Two alternatives would widen the

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[1] Pickering, Corts and Summerson, Inc., "In-depth Inspection Report for U.S. 30 over the Raystown Branch of the Juniata River, BMS No. 05-0030-0390-0064, The Narrows Bridge" (1993), 2.

existing bridge: adding a lane to each side of the structure, or adding two lanes to one side and preserving the historical appearance of one half of the bridge. The first scenario has already been rejected. A third alternative is the preferred course of action at this writing. The existing bridge would be rehabilitated, and another structure added downstream to carry two lanes of eastbound traffic. Damaged structural members of the existing bridge must be replaced, including spandrel columns, deck, and floor beams, as well as the parapet wall, which is deteriorating and will be reconstructed to meet new safety standards. The engineers propose installing a supplemental barricade inside the existing balustrade, which will be visible to drivers but not noticeable to viewers on the outside of the bridge. This will preserve the historic appearance of the balustrade in elevation.[2]

The Chambersburg-Bedford Turnpike and Bridges at the Narrows

The present Narrows Bridge is the sixth bridge to carry traffic across this important crossing of the Raystown Branch of the Juniata River. The route that crosses the river here has historically been important to the transportation network and economic development of the area. The crossing was under the control of the Chambersburg-Bedford Turnpike Company for almost a century. This turnpike road was one of a number established in Pennsylvania during a fifty-year period when the state turned its attention to improving infrastructure by investing in the construction of roads. Turnpikes were incorporated as private companies to be run for the profit of their investors. However, the state encouraged road-building efforts by buying shares in the companies.[3]

In 1806, the General Assembly passed legislation authorizing the incorporation of a company to construct a road from the Susquehanna River at Harrisburg to Pittsburgh. The state strongly encouraged the construction of this highway, which would traverse the entire state. The Pennsylvania Road, as it was called, was built by ten separate companies from Harrisburg to Pittsburgh, and the Chambersburg-Bedford Turnpike Company was one of these. Construction began in 1816.[4] "Completed in 1818 as an all-weather macadam pike, the Pennsylvania Road carried nine-tenths of all the transmontane traffic of the nation until the opening of the Erie Canal."[5]

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[2] William Delancey, of Pickering, Corts and Summerson, Inc., telephone conversation with author, 11 Aug. 1997.

[3] Philip S. Klein and Ari Hoogenboom, *A History of Pennsylvania,* 2nd ed. (University Park: Pennsylvania State Univ. Press, 1980), 202-3.

[4] John H. Nelson, *Down the Pike: A History of the Chambersburg-Bedford Turnpike Company* (McConnellsburg, Pa.: Fulton County Historical Society, 1989), 12-13.

[5] Klein and Hoogenboom, *A History of Pennsylvania,* 203.

The first bridge at the Narrows was built in 1818 by the Chambersburg-Bedford Turnpike Company.[6] This wooden bridge stood until the 1820s. On 21 October 1824, the state bought twenty shares of stock in the Chambersburg-Bedford Turnpike Company. Half of the purchase price was sent to the county for the purpose of rebuilding the bridge, indicating that the first one had been damaged or destroyed fairly recently.[7] The replaced bridge, which was also wooden, stood until Samuel Barnhart of Bedford and his wagon crashed through the deck and into the waters below. Fortunately Barnhart was able to save himself and his team, but the turnpike company was ordered to pay him $600.00 in damages.[8]

The third construction of the Narrows Bridge was also a wooden structure. It was destroyed by a windstonn on 13 July 1900, and replaced by a wooden covered bridge. An arsonist claimed the fourth bridge on 4 December 1902 by hauling a load of hay onto the bridge and igniting it. A local newspaper reported the next day that "The deed was undoubtedly done by white caps, for a note warning the toll gate keepers to leave was left on the stone wall next to the house occupied by Toll Gate Keeper Giffin and situated near the bridge."[9] The newspaper also reproduced the text of the threatening note, which was signed "Citizens" and stated that the toll gate keepers' house would be blown up in short order if tolls were still collected on the turnpike at this point. It is unclear who the white caps were, but locals who lived along the turnpike resented being charged a toll to cross the river or just get into town, and had tried to have the toll removed or bypassed for some time. The arsonists were probably among the residents of Friends Cove, who opposed the turnpike's control of this main local road and the tolls levied near the bridge.[10] After this incident the tollhouse was moved closer to the town of Bedford, near the intersection of Lincoln Highway and Pitt Street, where it stood until 1923.[11]

The Chambersburg-Bedford Turnpike Company took precautions against arson when they constructed the fifth Narrows Bridge of iron. This bridge stood at the crossing through the last days of the road's use as a turnpike, because the turnpike was subsequently condemned in order to make it a free road.[12] Maintenance responsibilities for the bridge were taken over by the

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[6] Scott C. Brown, et al., *Bedford and Fulton Counties, Pennsylvania: An Inventory of Historic Engineering and Industrial Sites* (Washington, D.C.: Historic American Engineering Record and America's Industrial Heritage Project, 1994), 135.

[7] Nelson, *Down the Pike,* 35.

[8] Nelson, *Down the Pike,* 36.

[9] "The wooden bridge across the Raystown branch ... burned early yesterday moming," *Bedford Gazette* (5 Dec. 1902), clipping, bridges vertical file, Pioneer Historical Society Library, Bedford, Pa.

[10] Brown, et al., *Bedford and Fulton Counties,* 136; Nelson, *Down the Pike,* 36.

[11] Brown, et al., *Bedford and Fulton Counties,* 136.

[12] The Bedford-Chambersburg Turnpike Company was officially dissolved in 1921. See Nelson, *Down the Pike,* 27.

county. The Sproul Highway Act of 1911, which created the Department of Highways, shifted roadway maintenance responsibilities to the state, but Bedford County was still responsible for repairs to the bridge. Finally, in 1929, the state assumed responsibility for both the roadway and the bridge, and "almost as soon as the Highway Department took over these bridges, it was decided to replace the old Crossings Bridge" further downstream along Lincoln Highway.[13] The Narrows Bridge would not be far behind in the Highway Department's efforts to upgrade the road.

Another important change for the Narrows Bridge came in 1916 when the route became part of the Lincoln Highway.[14] The iron bridge served automobile travelers along the nation's first coast-to-coast highway until 1934, when the present span was designed for the crossing. The iron bridge was not taken down until the Pittsburgh Construction Company completed the erection of the present Narrows Bridge downstream in 1935. They were also contracted to do the demolition of the old span. The stubborn iron bridge proved difficult to remove, although it eventually fell at the hands of the construction crew. The remains of it were washed away in a March 1936 flood.[15]

Bedford residents speculate that the Narrows Bridge of 1935 is the first (or one of the first) curved concrete bridges in the U.S.[16] The span's horizontal curve demonstrates the development of engineering skill because it represents a more complex structural problem than a straight alignment because of centrifugal forces applied by traffic. The curved roadway makes the very narrow crossing through Evitt's Mountain more amenable to auto travel. The steep slopes of the mountain on either side made it difficult to wind around them to cross the river, and the curve of the Narrows Bridge makes it possible for automobiles to maintain more speed while making their way through the gap. The upcoming rehabilitation of the Narrows Bridge is just another step in the long history of this important east-west crossing, which serves more travelers now than ever before.

This bridge is also the product of Department of Highways bridge engineers. It represents the transition to bridge design and construction by state employees rather than private road-building companies or local authorities. The significance of the professional bridge engineer increased in the twentieth century as states assumed responsibility for creating a more standard highway system suitable for automobile travel.

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[13] John Blackwelder, "Three Crossings of the Juniata," *Bedford Enquirer* (29 May 1930), clipping, bridges vertical file, Pioneer Historical Society Library, Bedford, Pa.

[14] Blackwelder, "Three Crossings."

[15] Ned Frear, "The Old Iron Bridge Didn't Just Wash Away," *Bedford Gazette* (n.d.), clipping, bridges vertical file, Pioneer Historical Society Library, Bedford, Pa.

[16] See, for example, Frear, "The Old Iron Bridge."

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APPENDIX: Suggestions for Future Research

Some questions concerning the Narrows Bridge arose during the research and writing of this report that, due to limitations in the scope of the Pennsylvania Historic Bridges Recording Project - I, have remained unanswered. Scholars interested in this bridge are encouraged to investigate the following:

1. Was the Narrows Bridge one of the first curved concrete arch bridges in the U.S.? When did this type of construction begin?

2. Are there other examples of this type of design in Pennsylvania? If so, were they designed by a particular engineer in the Department of Highways?